

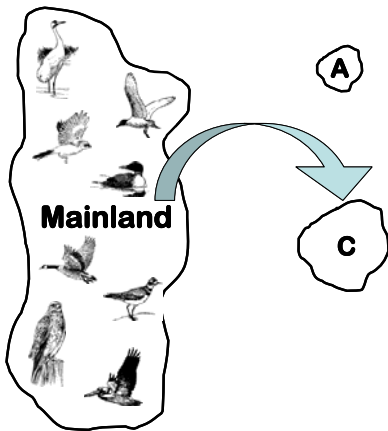
ISLAND BIOGEOGRAPHY

The study of biogeography attempts to explain why species are distributed as they are and why diversity (number of species) varies from one place to another. One area of biogeography investigates the relationships surrounding diversity on islands. Islands can be oceanic (like the one on the right), or more generally, they can be a patch of habitat surrounded by a different type of habitat. Mountain tops are great natural examples of habitat islands, and forest fragments are a common unnatural example resulting from urban land development. As humans continue to develop the landscape, more habitat islands or fragments will be created, and the principles of island biogeography will continue to be useful for species conservation.



The theory of island biogeography predicts the number of species on an island. The number of species on an island is affected by the size of the island and the distance from the nearest neighboring island or mainland.

Visualize four islands that differ in their size and distance from a mainland. Picture different bird species leaving the mainland and colonizing each of the islands.



Which island should have more species,

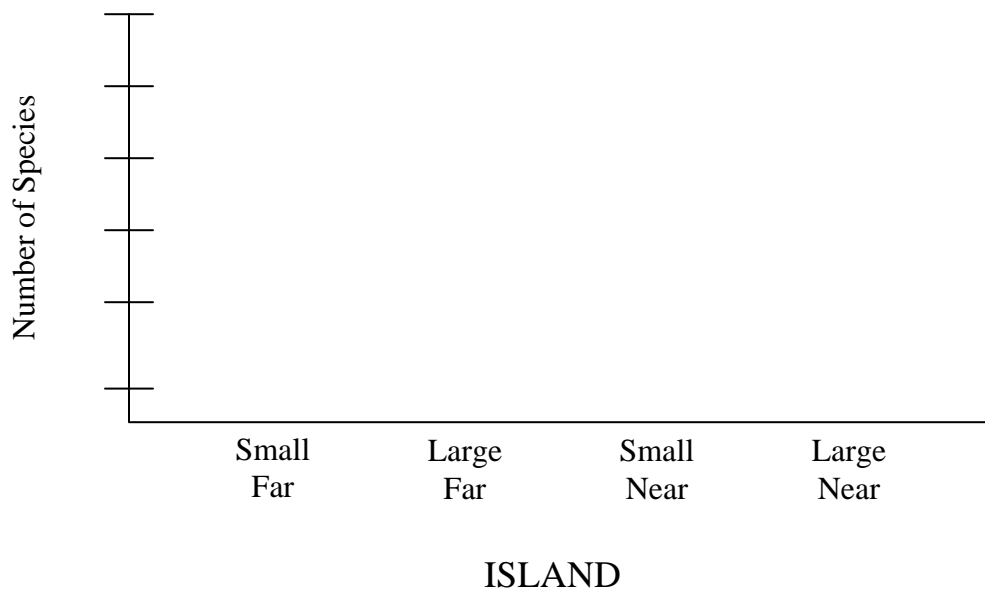
- Island A or B? _____
 - Island C or D? _____
 - Island A or C? _____
 - Island B or D? _____
- (Don't know? The activity will help.)

Objective:

To simulate species dispersal on islands which vary in size and distance from mainland (source populations) to actively learn the principles of island biogeography.

Instructions:

- 1) The four locations marked with duct tape will serve as mainlands, where you will sit with the source population (the marbles that have been distributed to you).
- 2) Each rug represents an island. There are two islands that are far, one small and one large, and two islands that are near, one small and one large.
- 3) When told, you are to roll marbles towards your island to try and get your species to stay on the island.
- 4) A marble which is knocked off of your island by another marble does not count as a species that colonized; this is an extinction event.
- 5) When all of the students at your island have finished, count the number of species that have successfully colonized your island and report this number to your instructor.
- 6) Now go to the island and collect your species (each student should have 10 marbles).
- 7) When told, rotate to the island to your right and repeat the instructions above.
- 8) When you have attempted to colonize each of the four islands, the activity is done.
- 9) At this time, the instructor will put the total number of species that were able to colonize the islands on the board. Put these values on the graph given below.



Discussion Points:

- 1) Given the resulting pattern, how does decreasing island size affect the number of species? How does increasing the distance from island to mainland affect the number of species?
- 2) How might the principles of island biogeography apply to species conservation?

- 3) There are many other examples of island habitats in nature beyond mountain tops and forest fragments. In the eastern part of the U.S., glades are a common type of island habitat. Glades are fire-maintained, prairie-like, island habitats that exist in a “sea” of forest (pictured below). Regulation of natural and man-made fires has resulted in the loss of these island habitats, and many of the unique plants and animals that can only be found in glade habitats in the eastern U.S. are threatened by extinction. If you had the opportunity to preserve some glade habitat to prevent species from going extinct, would you choose to preserve a single large habitat or several small habitats?

